REMARKS

Reconsideration as well as favorable action of the above-identified application is respectfully requested.

Applicants note with appreciation the indication that dependent claim 4 contains allowable subject matter and that it would be formally rendered allowable upon being re-presented in an appropriate self-contained format. However, Applicants consider the invention according to base claim 3 thereof patentable and, therefore, the re-presenting of claim 4 as an independent claim, at this time, is not necessary. In this regard, it will be shown below that the invention according to claim 3 was neither disclosed nor could have been suggested from Nanishi, et al. (JP 11-204440 A), which was newly applied. Accordingly, the standing rejection of claim 3 under 35 USC § 102(e), allegedly, as being anticipated by Nanishi, et al. is traversed and reconsideration and withdrawal of the same is respectfully requested.

A key aspect of the semiconductor device comprising plural transistors formed in a polycrystalline semiconductor thin film, wherein the polycrystalline semiconductor thin film is formed by plural laser irradiation steps, concerns the polycrystalline semiconductor thin film structure. That is, according to independent claim 3, the invention specifies:

> wherein the polycrystalline semiconductor thin film is formed by a plurality of laser irradiation steps, wherein the laser irradiation steps are carried out so that, after the last laser irradiation step, the number of crystal grains with the number of closest crystal grains of 6 is greatest among plural crystal grains that form the polycrystalline semiconductor thin film.

An example of such crystal grain formation associated with a polycrystalline semiconductor thin film is illustrated in Fig. 9(b) of the drawings, in which for the centrally located optional crystal grain 251, the number of closest crystal grains thereto is 6 (see also Fig. 5 as well as Fig. 8(b)).

Consistent with that set forth in independent claim 3, the polycrystalline semiconductor thin film is characteristically structured such that those crystal grains thereof with the number of closest crystal grains numbering 6 represents the largest lot of the same type of crystal grains that form the polycrystalline semiconductor thin film. This is specifically set forth in claim 3 of the invention with the following:

> the number of crystal grains with the number of closest crystal grains of 6 is greatest among plural crystal grains that form the polycrystalline semiconductor thin film.

The inventors realized that by implementing plural laser irradiation steps so that the shapes of the crystal grains are further transformed, for example, from an arrangement shown in Fig. 9(a) to the final structural arrangement shown in Fig. 9(b), a polycrystalline semiconductor thin film structure with superior characteristics develops. (Page 22, lines 7-22; and page 24, line 17 – page 26, line 16, of the Specification which discusses an improved polycrystalline semiconductor thin film structure in connection with the formation of transistors such as TFTs regarding disclosed embodiment 1 of the present application, although not limited thereto.) With regard to this, the laser beam irradiation is effected in two steps including a first excimer laser irradiation (e.g., 604 in Fig. 1) and followed by a second excimer

irradiation (e.g., 605). Discussion related thereto is given on page 24, line 17 et seq. and Figs. 2, 10 and 11. It is submitted, a semiconductor device which calls for among the featured aspects thereof a polycrystalline semiconductor thin film that is characteristically structured as that noted above was neither disclosed nor would have been suggested from Nanishi, et al.

Nanishi, et al. discloses a manufacturing scheme of a crystalline semiconductor thin film for opto-electronic use which involves radiating coherent synchrotron radiation or the like. With regard to this, in order to freely control the crystal structure and plane orientation of a growth surface without depending on the underlying material, Nanishi, et al. employs a technique calling for radiating coherent synchrotron radiation or the like from a plurality of directions to a specified two-dimensional interference image on the surface of an amorphous substrate and, at the same time, radiating molecules or atoms in connection with the formation of crystal material. However, Nanishi, et al.'s technique is only able to produce growth of a crystal structure through controlling, for example, a symmetrical property of 6 times, that is produce a crystal structure characterized by a hexagonal shape. This is clearly evident from paragraphs [0013]-[0014] of Nanishi, et al., which discuss Nanishi, et al.'s main idea with regard to the manufacture of crystalline thin film for opto-electronic use (see Appendix A which includes an English translation of the text of paragraphs [0013]-[0014] of Nanishi, et al.).

According to independent claim 3, however, the device specifically calls for the formation of a polycrystalline semiconductor thin film in which the crystal grains thereof with the number of closest crystal grains numbering six

represents the largest lot of the same type of crystal grains that form the polycrystalline semiconductor thin film. In other words, a transistor such as, for example, a TFT according to the present invention uses a polycrystalline semiconductor thin film that is structured such that the largest lot of crystal grains is characterized by crystal grains with the number of the closest crystal grains thereto being 6.

Consistent with that discussed above and as noted previously in the file history of the above-identified application, the number of crystal grains is quite different from the concept of the number of closest crystal grains, the latter being associated with the present invention. For example, the number of crystal grains may not necessarily be the same as the number of closest crystal grains. This concept is discussed in connection with Fig. 9 of the present Specification. For example, the number of closest crystal grains is 7 in the example shown in Fig. 9(a), although the shapes of the grains are hexagonal. As can be seen from Fig. 9(a), an actual polycrystalline thin film may include many hexagonal grains but some of these grains have closest crystal grains which number 7, etc. <u>The semiconductor device such as set forth in claim 3, etc., features an improved polycrystalline semiconductor thin film which includes many grains the largest lot of which being characterized as having closest crystal grains thereto numbering 6. In order to achieve this, the polycrystalline semiconductor thin film structure is defined as that which results after the last laser irradiation step is performed.</u> In other words, Nanishi, et al. failed to disclose or suggest a polycrystalline semiconductor thin film structure in which "<u>the number of crystal grains with the number of</u>

closest crystal grains of 6 is greatest among plural grains that form the polycrystalline semiconductor thin film," such as set forth in independent claim 3 (emphasis added). It is submitted, therefore, for at least the above reasons, the invention according to claim 3 could not have been anticipated nor, for that matter, rendered obvious from Nanishi, et al.'s teachings.

Therefore, in consideration of the supportive discussion/rebuttal arguments contained in these Remarks, withdrawal of the outstanding rejection as well as early allowance of the above-identified application is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to the Antonelli, Terry, Stout & Kraus, LLP Deposit Account No. 01-2135 (Docket No. 520.41003X00), and please credit any excess fees to such Deposit Account.

Respectfully submitted,

ANTONELLI, TERRY, STOUT & KRAUS, LLP

By Larry N. Anagnos
Larry N. Anagnos
Reg. No. 28,141

LNA/mlh
1300 North Seventeenth Street, Suite 1800
Arlington, Virginia 22209
Telephone: (703) 312-6600
Facsimile: (703) 312-6666